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ABSTRACT

In Malaysia, the government is supporting the diffusion of the Internet and is spearheading a project to bring Malaysia into the information age, by helping to design a smart city called the Multimedia Super Corridor (MSC). The MSC is being planned as a high-technology center where world-class multimedia companies can develop state-of-the-art products and services. Since Malaysia is undergoing a change from an industrial to information age, the MSC will guide the country in identifying how to use multimedia services in an efficient and competitive manner and will serve as a springboard for regional and global multimedia markets. This paper uses Malaysia as a case study to describe some challenges associated with the development of smart city mega-projects and to analyze the implications for librarians and information professionals. The underlying questions are, first, why is the MSC important to Malaysia's national development, and, second, what roles do librarians and information professionals play in the successful implementation of smart city projects? The need to increase information technology and information literacy skills is discussed, and the roles for librarians as end-user trainers and technology coordinators are highlighted. Contains 24 references, 19 endnotes, and 7 tables.) (MES)

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MALAYSIA'S MULTIMEDIA SUPER CORRIDOR AND ROLES OF INFORMATION PROFESSIONALS

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Introduction

With the convergence of computer technology and telecommunication, governments world-wide are devoting increased resources to the development of their information technology (IT) and multimedia industry as one of the central forces for future economical growth. Governments are orienting their development toward technological-intensive industries and higher value-added activities. They are implementing smart city mega-projects to attract and nurture top international companies' investment.

Currently, there are many smart city mega-projects being planned throughout the world. They are designed to implement economic revitalisation measures to cope with the ever intensifying inter-regional competition of the world. Mega-projects are funded by private industries, national and state governments as well as international investors.

Based in Japan, the Super Regions of the World project used primary and secondary research approaches to identify over two dozen smart city projects. Some mega-projects in Asia are Malaysia's Multimedia Super Corridor, Singapore's Singapore One, Philippine's Subic Bay Freeport, Taiwan's HsinChu Science Park, and India's Bangalore Information Technology Park.

In Malaysia, the Government is supporting the diffusion of Internet and spearheading an ambitious project to bring Malaysia into the information age. The project is the design of a smart city called the Multimedia Super Corridor (MSC). The MSC is being planned as a high-technology centre where world-class multimedia companies can develop state-of-the-art products and services. Since Malaysia is undergoing a change from an industrial to information age, the MSC will guide the country in identifying how to use multimedia services in an efficient and competitive manner. It will serve as a springboard for regional and global multimedia markets.

This article uses Malaysia as a case study to describe some challenges associated with the development of smart city mega-projects and to analyse the implications for librarians and information professionals. The underlying questions are first, why is the MSC important to Malaysia's national development, and second, what roles do librarians and information professionals play in the successful implementation of smart city projects. In other words, how can librarians support smart city developments that will require information and technological literate workforces?

The Multimedia Super Corridor (MSC)

Malaysia is a multi-racial country located in Southeast Asia, bordering Indonesia and the South China Sea. Figures from the Statistics Department of Malaysia indicate that the household incomes of Malaysians have gone up annually by between 6 and 10 per cent over a seven-year period (1). They show that families in urban areas such as Kuala Lumpur enjoyed higher increases in income growth than those

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families in rural areas. This has contributed to the higher level of education among people in towns, and better opportunities for employment.

Malaysia is a nation whose growth has been shaped by several strategic five-year development plans. The Vision 2020 Plan, a national agenda, provides specific goals and objectives for long-term development. One of the major challenges of the plan is for Malaysia to become a fully-developed, matured and knowledge-rich society by the year 2020. But like other countries in Asia, Malaysia is facing declining competitiveness in manufacturing, skilled labour shortages and an increasing cost of labour.

Therefore as a strategy to achieve Vision 2020, the nation has embarked on an innovative plan to leapfrog into the information age by creating the MSC, a vehicle for attracting world-class technology companies and developing local industries. The MSC is the brainchild of Malaysia's Prime Minister Dr. Mahathir Mohamad. It is planned as a smart city spanning an area 15 kilometres wide and 50 kilometres long, encompassing the Kuala Lumpur City Centre (KLCC) and the new Kuala Lumpur International Airport (KLIA). As a high-tech centre, it is attracting world-class corporations from around the world to set up their business units and R&D facilities.

According to the Multimedia Development Corporation Executive Chairman Tan Sri Dr. Othman Yeop Abdullah, 103 companies such as Sun Microsystems have been awarded MSC status. The Multimedia Development Corporation (MDC) is the one-stop agency created to facilitate the planning and implementation of the MSC.

Of the 103 companies which received MSC status, 37 are Malaysian companies; 28 are joint ventures between local and international companies; 12 are from Europe; 9 are from the US; 5 are from Japan; 1 is from Canada; and 11 are others [2]. The MSC status companies are provided financial incentives and a Bill of Guarantees. Under the Bill of Guarantees, the Government of Malaysia commits to providing a world-class physical and information infrastructure; unrestricted employment of foreign knowledge workers, competitive financial incentives such as no income tax for up to ten years, and a one-stop agency to handle all MSC queries.

The MSC is particularly attractive for international and Malaysian companies that develop or use multimedia technologies to provide value-added services, that consider expansion to Asian markets a strategic priority, that are prepared to contribute to the creation and development of any of the seven Flagship Applications, that are willing to take advantage of the MSC's high-performance infrastructure and ground-breaking cyberlaws, and that are interested in helping to shape a new development model for Asia's Information Age [3].

Global Diffusion of MSC - Role of Librarians

As the MSC is being discussed within Malaysia, librarians have conducted research to identify relevant overseas websites and to measure the international interest. One study uses a new methodology called web linkage analysis. The online linkage analysis is a diffusion approach using web search engines to analyse the current level of interest in an emerging topic. The results of the linkage analysis were sent to managers at the Multimedia Development Corporation (MDC). The one-stop agency for MSC planning and implementation.

The online linkage analysis was conducted using the fragment field search capabilities of the Alta Vista search engine. In Kochler's [4] article on specialised retrieval, he describes fragment search as the capability of searching fields within the HTML source code. In Alta Vista, different fields can be searched such as those listed in Table 1.

Table 1 - Field Search in Alta Vista Search Engine (www.altavista.digital.com)

Information	Field Name	Sample Search Statement
Website address	url	url:www.whitehouse.gov (Locate the website with this specific address)
Specific country	domain	domain:my (Locate all websites on in-country servers in Malaysia. The two-letter country code is from the ISO 3166.)
Website that has a hypertext link to specific website address	link	link:www.mdc.com.my (Locate all websites that have hypertext link to the web address www.mdc.com.my)

Linkage analysis provides the capability to identify what websites have hypertext links to a specified site such as www.mdc.com.my (MDC's website). The retrieval results provide a list of websites that are linked to www.mdc.com.my. The linkage data is used as an indicator of which foreign organisations or individuals want to keep up with the latest developments about the MSC. It indicates a level of current interest in the MSC. To analyse the interest, the websites must be examined.

For example, using the Alta Vista search engine, a search was conducted for websites that are linked to the MDC's homepage (www.mdc.com.my). Using the search statement link:www.mdc.com.my -domain:my retrieved the websites for foreign organisations or individuals who have a hypertext link to the MDC such as the Muslim Brothers Chambers of North America (www.mbcna.org/links.htm). The "-domain:my" is used to eliminate retrieval of websites that are on in-country servers in Malaysia. In November 1997, the search resulted in 1479 hits (websites) but only 282 sites could be accessed for analysis. (Regarding the problem of displaying all 1479 hits, the Alta Vista's webmaster was contacted and responded that there is a technical problem in displaying all of the results.)

Table 2 identifies the type and location of overseas organisations that link to MDC's website. With about 14,000 Malaysian students studying in US institutions of higher learning, this impacted on the number of US based websites that linked to the MDC's website. Since many US universities provide free Internet access and homepages for students, some Malaysian students' homepages provide links to the MDC. Additionally, US commercial organisations that provide free homepages such as Geocities have many Malaysians who provide links to the MDC. Malaysians are active in describing and diffusing the MSC concept overseas.

Table 3 summarises some results of the linkage analysis. It indicates that several governments are conducting smart city research which includes the MSC. For example, Australia's Department of Trade and Industry commissioned a benchmarking study to analyse how five countries (Singapore, Malaysia, UK, Ireland and Israel) pursue strategies that aim to foster development of their information industries. It provides a comparative analysis of the nations' experiences in the areas of smart city developments, venture capital, tax concessions, support for R&D, and educational training. It compares two smart city projects: Singapore's Singapore One and the MSC. In the US, The Trade and Development Agency commissioned a study on the MSC to identify opportunities and outline strategies for American investors.

Organisations have also established new consortia to monitor smart city developments. The consortia include Super Regions of the World (Japan), ANCARA (Netherlands), and the Global Information Infrastructure Commission under the auspices of the Institute of Strategic Studies, Georgetown University (US). Table 4 identifies some of the major smart city projects. In addition to the linkage research, a comprehensive subject search was conducted using several search engines. As a result of the linkage and subject research, the consortia and foreign government projects are being tracked as part of a MSC selective dissemination of information (SDI) service.

Some Challenges in Developing the MSC

Although there are several challenges facing the MSC such as infrastructure development and the current economic crisis in Malaysia, one of the most critical is human resources. According to MDC's

Executive Chairman Dr. Othman, human resource is a critical issue because of the global shortage in IT and multimedia experts (5). Other comments indicate that MSC observers worry Malaysia's chronic shortage of skilled labour, especially engineers, will pose problems for organisations which want to hire locally (6).

It is estimated that companies which have already received MSC status will require more than 16,000 knowledge workers over the next few years (7). In Malaysia, there is a need to produce 8,000 IT and computer science graduates annually as well as to nurture creativity and entrepreneurship skills.

To assist in the challenge of educating more Malaysians for the MSC, the Government has authorised the establishment of several new institutions of higher education. These include but are not limited to the Multimedia University, the Malaysia University of Science and Technology (MUST), and the Universiti Tun Abdul Razak (Unitar). Unitar is the country's first virtual university. Furthermore, other distance learning programmes and open university institutions continue to emerge into the Malaysian education industry.

Since the MDC recognises the important roles that institutions of higher education play in developing smart-city, the MDC has developed guidelines for allowing education institutions to get MSC status. The guidelines are a positive step towards developing a substantial pool of knowledge workers required for the MSC (8). By awarding MSC status to colleges and universities, they will be able to enjoy the competitive financial incentives including no income tax for up to 10 years, and no duties on importation of multimedia equipment. In order to evaluate applications of colleges and universities that are applying for MSC status, an information specialist, Dr. Edna Reid, was hired as a consultant to assist in designing the assessment instrument.

The recognition of the importance of higher education in developing smart-city can be compared to developments in the Silicon Valley and the Research Traingle Park, USA. The growth of the Silicon Valley was stimulated by education and R&D institutions such as Stanford University, San Jose State University and Xerox's Palo Alto Research Center. Silicon Valley produces more technical graduates than any region in the US - with over 4,100 engineers graduated in 1995 (9). Of this total, 1500 graduates are from Stanford. Additionally, this resembles the development of another high-tech region called the Research Triangle Park located in Chapel Hill, North Carolina, USA. For the Research Park, major universities such as Duke University and the University of North Carolina were an indispensable building block (10).

Regarding human resource development, Malaysia's Education Ministry is leading several initiatives to increase IT literacy, IT teacher training, and utilisation of IT in schools. The education system is being re-engineered. Under the MSC, 90 smart schools will be established throughout the country. Smart schools are networked schools that will be equipped with IT resources to develop personalised, interactive courseware and to access information from around the world (11). In April 1998, the Education Minister announced that all future graduates of local Malaysian public universities, irrespective of their degrees, will be computer literate and competent in IT (12). This announcement was made at the first MSC Educational Forum on 13 April 1998. The MSC Educational Forum was attended by 75 representatives from local educational institutions and provided an opportunity to introduce the assessment instrument. Additionally, the Forum was used to launch a new book "Multimedia Super Corridor: A Journey to Excellence in Institutions of Higher Learning" (13). Although the book was written by four authors, one author is an information specialist. The book examines how the MSC, working in a smart partnership with institutions of higher education, can assist institutions in re-engineering the curriculum, developing new relationships with MSC companies, enhancing competencies of graduates for MSC employment, and achieving world-class status.

Need for Information Skills

As IT training programmes proliferate in Malaysia, one of the major content omissions is information literacy skills. As described in Karelse's description of information literacy discourse in Malaysia, emphasis is placed on IT literacy and information literacy is rarely highlighted (14). She contributes this

to Malaysia's emphasis on development of the information infrastructure and the belief that through making the technology transparent, people will become information literate.

Within Malaysia, a few managers are mentioning information literacy. For example, information skills development is in line with Tengku Mohd Azzman Shariffadeen's definition of an IT-literate society. Tengku Mohd Azzman is a member of Malaysia's National Information Technology Council. According to Azzman, Malaysians must develop IT and information literacy skills. He said that an IT-literate society must attain a higher level of information literacy so that one can identify, use, and manipulate information (15). He emphasised that IT literacy should not stop at information literacy but extend to a level of knowledge literacy. Except for training conducted by some Malaysian librarians, most IT training programmes do not include information literacy.

In the US, UK, and Australia, information skills is one of the core competencies for workforces in the 21st century. According to studies of workplace skill requirements in the US, Australia and New Zealand, the process of gathering, synthesising and analysing information is beginning to assume the same level of importance as reading and writing.

One of the premier studies was conducted by the Secretary's Commission on Achieving Necessary Skills (SCANS), US Department of Labor. It identified the fundamental skills and workplace competencies needed for Americans. The SCANS includes several reports such as What Work Requires of Schools (SCANS initial report, June 1991), Learning a Living: A Blueprint for High Performance (SCANS final report), and Skills and Tasks for Jobs (curricula to teach SCANS skills). Summaries are available at www.nsba.org/sbot/toolkit/chnwp.html.

According to the SCANS, the high-tech workplace requires workers who have a solid foundation in the basic literacy and computational skills, in the thinking skills necessary to put knowledge to work, and in the personal qualities that make workers dedicated. Additionally, SCANS states the workplace requires competencies to manage resources, to acquire and use information, to master complex systems, and to work with a variety of technologies. Table 5 provides a comparison of the skills identified for workforces in Australia, UK, US, New Zealand, and Canada. It is a revision of an earlier comparison available at the British Columbia Ministry of Education Skills and Training's website (www.est.gov.bc.ca/psf/data/5nations/append2.htm).

Other Roles of Librarians and Information Professionals

In Malaysia, there is a need to increase IT and information literacy skills, to help alleviate shortage of multimedia skills among lecturers, to train faculty and students to become critical users of electronic services, to develop strategies for dealing with electronic information overload, to design distance education modules, and to provide more support for information have-nots. For librarians, some of these requirements can be categorised under the roles of end-user trainer and technology coordinator.

End-user Trainer

The explosive development in web technologies has exposed the breadth of electronic information available to end-users at their desktop. As a result, more Malaysian librarians have expanded their roles to serve as Internet trainers, webmasters, and Internet subject specialists. For example at the Universiti Putra Malaysia (UPM), a team of librarians provide Internet training to students and faculty. Using a subject approach, the team maintains a value-added library website with links to curriculum resources available on the Web. With the extensive interest in the MSC, the team has over a dozen links to local and international websites that describe the MSC (lib.upm.edu.my/resfrm1.html). At the Sabah Public Library, the Internet team provides on-line training and webmaster consultancy services to government and private industries. The team has led in designing content-based training programmes that help end-users maximise the tools available to them at the desktop.

With the increasing local demand for Internet training and access, most librarians probably have only limited time to expand their training from basic Internet to electronic information literacy. A basic Internet training programme approaches training from a tool perspective where the teaching focuses on

how to use Web search engines, electronic transfer of files (FTP), e-mail, and electronic discussion groups. For an electronic information literacy course, the emphasis is on an integrated approach of using information problem-solving strategies to accomplish workplace tasks. This approach moves the focus away from tools and towards accomplishing workplace tasks.

For example, Eisenberg/Berkowitz's Model of Information Problem-Solving identifies six steps in the process of developing transferable cognitive skills (16). The steps include problem definition, information seeking, location and access, use of information, synthesis, and evaluation. In analysing how the model can be applied, the following scenario is used: a manager wants a summary of how the MSC is being diffused overseas and a list of actions taken by foreign businesses and governments.

Table 6 summarises how Eisenberg/Berkowitz's model was applied to the task listed above (17). The information problem was analysed first from a task definition perspective. Several questions were identified; a list was generated of background information; local contacts were called; and keywords were identified. Next, one has to think about the kind of information needed to get the job done. Since diffusion of the MSC concept in foreign countries can refer to the spread of the MSC overseas, it was assumed articles, news stories, press releases, and comments from overseas sources are important.

In addition, information describing the actions taken by foreign governments and businesses are essential resources. Table 7 identifies the information seeking strategies and search statements for locating relevant sources. The strategies focused on contacting relevant persons and searching commercial databases, library collections and websites. In summary, hundreds of overseas articles about the MSC were located. An article in the New Straits Times provides more details of this particular task exercise and describes the actions taken by foreign governments and private organisations (18).

This scenario-based example is a component of an information literacy workshop entitled Electronic Information Problem-Solving for Managers. It provides an approach for assisting clients in developing electronic information problem-solving strategies. Electronic information problem-solving skill is an important competency for the MSC. In converting end-users into information literate persons, several Malaysian university libraries have initiated other programmes. But more programmes are needed.

Technology Coordinator

With rapid technological developments, librarians must continue to expand their roles to become technology liaisons or coordinators. They must continue to anticipate the technological needs of clients; they must monitor, evaluate, and integrate relevant emerging technologies. Also, they must track technological gaps, deficiencies, innovations, and potential solutions. For example, many librarians have not developed strategies for searching the hidden part of the Internet. As Internet specialists, librarians must be proficient in identifying full-text resources on the web and conducting web-based research.

On Internet, a great deal of valuable information content is included in neither automatically created web databases such as Excite or the more selective subject directories (19). Often this content is hidden from the search engines' spider (program that identifies websites). Even the largest search engines such as Alta Vista and HotBot, do not send their spiders behind an Adobe PDF file or other formatted files. Therefore, the content of these full-text files are not indexed in the search engine database.

For example, the NSW Department of Training and Education Co-ordination's key competencies study analyses the skills needed for Australian workforces. This study is in the PDF (portable document format) and contains ten chapters. Yet the chapters are not indexed full-text in search engines. Only the bibliographic information about the report is indexed.

Another hidden section of Internet is the increasing number of free and fee-based sites that require a log-in such as the South China Morning Post Online. The South China Morning Post Online stories are not included in the search engines database because the spiders do not spend their time going through the registration process. A third component of the hidden part is data sets. Many sites contain significant collections of statistical data that are not indexed in search engine databases. For searching the hidden part of the Net, Notess outlines several strategies for librarians. He describes services such as

NewsTracker which provides one with the capabilities of searching at least a portion of the hidden part. NewsTracker is a search engine for recent newspaper and magazine websites, some of which require a log on. NewsTracker is programmed to complete the website registration process.

In addition to monitoring technological gaps, librarians must increase their support to users. In Malaysia, organisations have Internet and Intranet services that are under-utilised. In non-technical departments such as human resources, many end-users are unaware of how they can use Intranet to support on-line training, communication, and information sharing. During the current economic times in Asia, librarians must design specialised workshops or programmes to reach the IT less-literate workforces.

Therefore, the support is needed in specialised areas such as assisting users in forming Intranet teams, conducting information audits, identifying external multimedia resources for a department's Intranet, and helping departments to design and use their Intranet. This type of support is needed also in local knowledge management projects. The concept of managing an organisation's knowledge contains lessons learned in library science, information management, and IT. It involves capturing information, reshaping information, adding value to information, creating knowledge, and transferring knowledge to the desktop. Librarians' skills are needed in this emerging area. In Malaysia, some MSC companies are trying to design knowledge management projects and recruit persons to become knowledge managers.

The challenges of shifting roles for librarians require additional training. Within Malaysia, professional associations should compile a database of experienced professionals who can conduct value-added workshops. Some suggested courses include Telecommunications for Librarians, Using Intranet for Training, Creating an Information Audit, Business Intelligence and Web Resources, Knowledge Management, Designing Qualitative Performance Measurements for Libraries, and On-line Monitoring of Smart City Developments.

Conclusion

Malaysia has embarked on an ambitious plan to leapfrog into the information age by creating the MSC. The MSC will be supported by a high-capacity, fully-digital telecommunications infrastructure and world-first legislative framework. With the planned sophisticated capabilities of the MSC, it is important for Malaysians to be full participants in the planning and implementation of this mega-project.

For the MSC, one of the major challenges is the development of human resources. Malaysia must educate and train thousands of engineers, programmers, systems analysts, and other knowledge workers for the MSC workforce. Librarians are major players in human resources development. They are empowering end-users to deal systematically with electronic information overload, to exploit multimedia for education and research, to create more local content, to assess content critically, and to use web technologies for lifelong learning. Their roles are shifting rapidly to a greater emphasis on training end-users to become Internet and information literate. As illustrated in Table 5, countries such as Australia, US, and New Zealand have analysed the skills needed for an increasingly global high-tech workforce and identified information literacy as one of the core competencies.

Historically, librarians have been on the forefront of technological developments which support the proficient use of information. With the rapid pace of technological innovations, they are starting to expand their roles to trainers and technology liaisons/coordinators. They are analysing the technological needs of clients, monitoring the emerging services, evaluating performance of the technologies, and integrating relevant technologies into the library's operations.

With further implementation of smart city projects, librarians will become more involved in their organisations' corporate-wide Intranet teams, community outreach projects, outsourcing services, distance education projects, knowledge management projects, information entrepreneurship, lifelong learning projects, and business intelligence ventures. Yes, librarians' activities and physical locations will increasingly be outside of the library. To assume these emerging roles, they must continue to participate in leading-edge training programmes, conferences and innovative projects. Smart city developments will expand the responsibilities of librarians/information professionals in unprecedented ways!

Table 2 - Overseas Organisations Having Hypertext Link to MDC's website (www.mdc.com.my)

Country	Academic (.ac, .educ)	Commercial (.com)	Govt (.gov)	Network (.net)	Organisation (.org)	Unknown	Total
Australia	5	2			1	1	9
Belgium					1		1
Brussel		1					1
Canada		1					1
France				1	1	3	5
Germany	1					1	2
Hong Kong			1				1
Hungry			1			1	1
Ireland						1	1
Japan	2	4			5		11
Netherlands					1	1	2
New Zealand		1					1
Singapore	4	1	1				6
South Africa	1						1
Taiwan			1	1		1	3
UK	6	3	1				10
US	13	32	2	3	2		52
Unknown		1		1	3		5
Total	32	46	7	6	14	9	113

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Table 3 - Summary of Results of Diffusion Linkage Analysis of MSC Overseas

Information Task	#	Examples
Background news stories (overseas) - MSC	180	*San Jose Mercury News*: "Multimedia Super Corridor: Malaysia's high tech dream (has photos, news stories, links to Malaysia & discussion forum) www.smercury.com
Current awareness (overseas)	13	Department of Trade & Industry's Study (UK) Ausasia - linking Australia to Asia - www.auasia.com.au/
Government responses (overseas)	14	View "Global Electronic Commerce: Who'll Make the Rules?" an Online Seminar which appeared on Counsel Connect from January 13-22, 1996: Executive Office of the President (US) (90 pages of discussion in which the MSC is mentioned) - www.itf.nist.gov/eleccomm/feedback.htm Dept of Trade & Industry (Australia) - Spectator or Serious Player? www.dist.gov.au/it/tskforce/allen/chapter5.html US Trade & Development Agency - requested study of MSC - www.tda.gov/docs/pipeline/section1.nn.html Hong Kong Government Study Trip to MDC (Oct 97)
Investment data - about MSC	6	PANARIE (Pacific Network for Advancement of Research, Industry & Education) www.quorumgrowth.com/panaric.htm InterVent's Virtual Trade Missions of countries abroad - www.flash.net/~intrvent/
Organisation & univ (overseas) - actions	12	Super Regions of World (Japan) - www.gsr.or.jp/english/index.shtml Advanced Network Cities & Regions Association, ANCARA (Netherlands) - www.ancara.nl/intro.html European Multimedia Forum (Belgium) www.emf.be/main.htm Several universities link to MSC for their business & communication courses at NTU & NUS in Singapore, University of Southern California in US, Germany
Reports/studies (overseas)	9	Australia Information Industry Assocation's report on Becoming competitive (uses MSC as a model) - www. Futuristic View of the Future: Creating simply 2035 (focus on IT trend setters include PM Mahathir Mohamad) - www.wcic.org/~walloyrog/future9.htm SRI's Malaysia's Multimedia Super Corridor: Techno-Push into Utopia? 21 page fee-based report - future.sri.com/bip/datalog/dldesc/2096.html
Tradeshows (overseas)	3	BESA UK: Make IT Malaysia

Table 4 - Some Smart City Projects of the World

Country	Name of Project
Australia	MFP Australia
Canada	Smart Toronto
India	Bangalore Technology Park
Netherlands	De Digitale Staad (The Digital City, Amsterdam) Project Red
Japan	Kanagawa Prefecture Kanagawa Multimedia Consortium Kanagawa Prefecture Kanagawa Science Park (KSP) Hyogo Prefecture Kobe City Kobe Multimedia&Entertainment City (KIMEC)
Malaysia	Multimedia Super Corridor (MSC)
Philippine	Subic Bay Freeport
Singapore	Singapore One
Taiwan	HsinChu Science Park
United States	Blackburg Village (Virginia) Pacific NorthWest Economic Region (Seattle, Washington) Sannet (San Diego, California) Smart Valley: Silicon Valley (California)

Excerpt from Super Regions of the World www.gsr.or jp/english/index.shtml and
Advanced Network Cities & Regions Association (ANCARA) www.ancara.nl

Table 5 - International Key Competencies Comparison for Australia, UK, US, NZ, and Canada

Key Competencies Australia (1992)	**UK (NCVQ) Core Skills** (1992)	**US (SCANS) Workplace Know-How** (1991)	**NZ Essential Skills**	**Canadian Workpalce Skills** (1996)
· ***Collecting, Analysing and Organising Information***	· Communication	· ***Information*** · Foundation Skills: Basic Skills	· ***Information***	· Communication · Dispute Resolution Skills
· Communicating Ideas and information	· Communication · Personal Skills: Improving own Learning and Performance	· Resources · Foundation Skills: Personal Qualities	· Communication Skills	· Listening Skills
· Working with Others and in Teams	· Personal Skills: Working with Other	· Interpersonal Skills	· Self-Management Skills · Work and Study Skills	· Group Skills · Cultural Sensitivity
· Using Mathematical Ideas and Techniques	· Numeracy: Application of number	Foundation Skills: Basic Skills	· Numeracy Skills	· Learning to Learn
· Solving Problems	· Problem Solving	Foundation Skills: Thinking Skills	· Problem-Solving and Decision-Making Skills	· Problem Solving
· Using Technology	· Information Technology	· Technology · Systems	· ***Information Skills*** · Communication Skills	· Computer Literacy
		· Modern Foreign Language		Career Development Skills

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Table 6 - Application of Eisenberg/Berkowitz Information Problem-Solving Model

Information problem - overseas diffusion and impact of the MSC (viewpoints & acitivities of foreign business persons & govt off icials)

Step	Activities	Activities	Activities
1. Task definition	Ask questions: What is multimedia super corridor (MSC)? What is meant by diffusion of MSC - overseas? (refers to spread of new idea so want to know how many news articles/reports, what countries involved) What is meant by impact of MSC - overseas? (refers to what action is being taken as a result of new idea)	Identify prior knowledge: MDC is one-stop enterprise for MSC. MATRADE involved in encouraging overseas persons to invest in Malaysia. Prime Minister & MDC officials sponsored overseas speaking engagements about MSC.	Identify keywords: multimedia super corridor, MSC, Malaysia, impact, opinions, perspective
2. Information seeking strategies	Determine range possible sources (brainstorm).What kind of data needed - background about MSC, factual information, current awareness information (See Table 2)	Evaluate sources - determine accuracy, objectivity, how recent, source of information	Select best sources. Identify most useful materials for answering your problems.
3. Location & Access	Locate sources. Where can find resources to resolve problem? (See Table 2)	Find information within sources	Identify relevancy of sources
4. Use of Information	Interact with information/data - read, hear, view, ...	Extract relevant information/data from source	
5. Synthesis	Organise information from different sources	Analyse information	Present information
6. Evaluation	Judge the information product effectiveness	Judge information and problem solving process	Assess value of content and process. Adjust search strategy so can be modified and/or repeated (if necesesary).

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Table 7 - Information Seeking Strategies & Location/Access.

(What do you need to get the job done?)

Information Task	Information Resource Type	Location & Access
Background data (awareness knowledge*) (Get an estimate of number of foreign news stories & sources for assessing the level of interest in business and government communities.)	news stories, press releases, articles about multimedia super corridor - overseas, electronic discussions about the MSC (non-Malaysian discussion groups)	Call or email MDC. Ask them to send copy of their press releases & overseas itinerary. Ask for statistics about their website. Access MDC website - download press releases. Search news articles & press releases via Web, NSTP On-line (fee-based), The Star Online web site, local libraries, etc.
Factual resources (how-to knowledge*) (Get data to assess what actions or decisons business & govt officials may be making regarding MSC.)	foreign government, businesses or NGO reports, comparative studies, memos, statistics, action plans - about MSC. Course outlines	Call contacts at foreign government embassies in KL. Send email & ask the foreign officials for any reports on MSC. Search web for resources. For example using AltaVista: "multimedia super corridor" +domain:gov
Current awareness services (awareness knowledge*) (Identify information indicating whether foreign organisations are using mechanisms for keeping current on MSC developments. Assess if MDC website is popular or accessed often by foreign organisations.)	current awareness news services, discussion groups, newsletters, reports about developments on MSC - provided by foreign organisations	Search web sites, fee-based database services, e-journals, trade shows, conferences, seminars. Alta Vista search link:www.mdc.com.my (identify what websites have hyptext links to MDC homepage)
Investment data (how-to knowledge*)	reports, newsletters, venture capital companies offering MSC support	Search web sites, fee-based database services, government investment reports

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